

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
FCC Requests Comment on Spectrum Needs)	
of Emergency Response Providers, Input)	WT Docket No. 05-157
Required for FCC Report Mandated by the)	
Intelligence Reform and Terrorism Prevention)	
Act of 2004)	

Comments of Ericsson Inc

To: The Commission

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I. Summary.

Ericsson Inc (Ericsson) applauds the efforts of Congress and the Federal Communications Commission (FCC) to further investigate how best to satisfy the wireless communications needs of public safety agencies. However, Ericsson is not convinced that allocating additional 700 MHz spectrum for public safety use at this time would achieve the goal of interoperability. Rather, an interoperable nationwide wireless communications network for the public safety community can best be accomplished by:

- Recognizing that allocating additional spectrum in the 700 MHz band for public safety now is premature, will not directly increase the amount of available spectrum until the DTV transition is resolved, and could divert focus from the core issues that currently prevent public safety interoperability;
- Recognizing, as it did in its *4.9 GHz Order*, the vast benefits commercial technology can provide to the public safety community, including advanced technology, spectrum efficiency, interoperability, and broadband communications at affordable costs, and that auction of the C and D blocks of 700 MHz spectrum for commercial use can help make these benefits available to public safety users;
- Encouraging the public safety community to use its existing spectrum more fully and efficiently by establishing flexible public safety spectrum management policies, specifically allowing aggregation of spectrum in 700 MHz beyond 150 kHz; and
- Encouraging public safety agencies, through incentives and other means, to use standardized commercial wireless technologies and systems, either within their existing dedicated spectrum or in commercial spectrum, to the extent commercial solutions satisfy public safety requirements.

Ericsson agrees with Congress and the FCC that a nationwide interoperable public safety network would provide great benefits to the public. Commercial solutions should be a primary means by which the public safety community can achieve interoperability, broadband capability, and spectrum efficiency in a cost effective way. By encouraging integration of commercial technology into public safety networks, the FCC will help satisfy the wireless communications needs of public safety agencies, including achieving interoperability, a goal that has proven to be elusive for dedicated public safety technology.

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Ericsson Inc (Ericsson) hereby submits comments in response to the Federal Communications Commission's (FCC or Commission) Public Notice,¹ released March 29, 2005.

In the National Intelligence Reform Act of 2004 (NIRA)² Congress directed the FCC to

. . . conduct a study to assess the short-term and long-term needs for allocations of additional portions of the electromagnetic spectrum for Federal, State, and local emergency response providers, including whether or not an additional allocation of spectrum in the 700 megahertz band should be granted by Congress to such emergency response providers.³

In response to Congress' directive, the FCC requested comment on public safety wireless communications issues, including whether or not Congress should provide additional spectrum for public safety use in the 700 MHz band, the extent to which commercial wireless technology

¹ Public Notice, Federal Communications Commission Requests Comments on Spectrum Needs of Emergency Response Providers, WT Docket No. 05-157 (Mar. 29, 2005) (Public Notice).

² See National Intelligence Reform Act of 2004, 108 Pub. L. 458 § 7303(a)(1)(E), 118 Stat. 3637 (2004). NIRA is part of an executive initiative by the United States to "promote the development and implementation of a U.S. spectrum policy that will foster economic growth; ensure our national and homeland security . . . and satisfy other vital U.S. needs in areas such as public safety . . ." Fact Sheet on Spectrum Management (Jun. 5, 2003) available at <<http://www.whitehouse.gov/news/releases/2003/06/20030605-5.html>> (Apr. 4, 2005) (Executive Fact Sheet).

³ See NIRA at § 7502(a).

may be used to satisfy the communications needs of emergency response providers (ERPs), and, generally, the future spectrum needs of ERPs for interoperability purposes and otherwise.⁴

Congress' initiative to enhance interoperable public safety communications was prompted by a series of events over the past ten years, including the 1995 Oklahoma City bombing, the 1999 shootings at Columbine High School, and, most recently and cataclysmically, the terrorist attacks of September 11, 2001. These events revealed a serious deficiency in our nation's public protection and emergency response abilities: the "inability . . . to communicate with one another within and across jurisdictions and disciplines."⁵ Public safety's inability to communicate effectively between agencies, forcing responders from different agencies and jurisdictions to resort to self-dispatch and improvisation with no central point of command, slows emergency response and often results in unnecessary loss of lives and property.⁶

Government and the public safety community agree that public safety communications need to be made fully interoperable, to be able to "work seamlessly with other systems or products without any special effort . . . to share information via voice and data signals on demand, in real time, when needed, and as authorized."⁷ Providing this ability to the entire public safety community is a large task that does not have a simple one-step answer. As noted by public safety representatives, key barriers to interoperable public safety communications are "incompatible and aging communications equipment, limited and fragmented budget cycles and

⁴ See Public Notice at 2.

⁵ Connecting the Operations of National Networks of Emergency Communications Technologies for First Responders Act of 2005, H.R. 1251 (introduced in House Mar. 10, 2005) at § 2(a)(2).

⁶ "Learning to Talk: The Lessons of Non-Interoperability in Public Safety Communication Systems," The Atlas Project, Advanced Technology in Law and Justice, University of New Hampshire, *available at* <<http://www.justiceworks.unh.edu/justiceworkspub.pdf>> (Learning to Talk) at 23-24.

⁷ "Interoperability," SAFECOM Program, *available at* <http://safecomprogram.gov/SAFECOM/interoperability/default.htm> (Apr. 5, 2005).

funding, limited and fragmented planning and coordination, limited and fragmented radio spectrum, and limited equipment standards.”⁸ Congress has asked the FCC to investigate the merits of public safety’s request for additional 700 MHz spectrum, and is seeking further information on whether additional public safety spectrum will properly resolve interoperability issues.

Although Ericsson supports the establishment of a nationwide interoperable public safety network, it does not believe that allocating additional 700 MHz spectrum for public safety use at this point will best achieve this goal. In fact, allocating more spectrum now is premature and may risk diverting focus from core interoperability issues and ultimately isolate ERPs even further. Instead, commercial wireless technologies, systems, and networks can readily address many public safety needs, including efficient spectrum use and interoperability across multiple frequency bands, while also meeting many of its service requirements.⁹ If Congress provides the public safety community with additional 700 MHz spectrum now and does not take steps to encourage public safety use of commercial technologies, it will effectively continue to segment public safety into dedicated networks and prevent public safety from fully accessing tools needed to achieve greater efficiencies and improved communications among public safety systems.

Ericsson applauds the efforts of Congress and the FCC to further investigate how best to satisfy the wireless communications needs of public safety agencies. Ericsson provides the following comments:

⁸ “The State of Public Safety Communications,” SAFECOM Program, International Symposium on Advanced Radio Technologies, *available at* <http://www.its.blrdoc.gov/meetings/art/art04/slides04/cot_t/tutorial_c_slides.pdf> (Mar. 2, 2004) at 7.

⁹ See “Statement of Requirements for Public Safety Wireless Communications and Interoperability,” The SAFECOM Program, Department of Homeland Security (Mar. 10, 2004) (SAFECOM Statement of Requirements) at 51-84.

- Allocating additional spectrum in the 700 MHz band for public safety now is premature and could divert focus from the core issues that currently prevent public safety interoperability;
- Standardized commercial technologies are particularly suited for providing public safety with interoperable broadband networks. These networks can serve public safety needs efficiently and cost-effectively through deployment of commercial systems in dedicated public safety spectrum or utilization of services and applications in commercial bands;
- Commercial technologies are being effectively integrated into public safety networks around the world;
- The FCC should encourage the public safety community to use its existing spectrum more fully and efficiently through improved technology and by establishing flexible public safety spectrum management policies, specifically allowing aggregation of spectrum in 700 MHz beyond 150 kHz;
- The FCC should recommend that Congress request a study investigating the sources of inefficiencies in current public safety spectrum use and recommending methods of addressing those inefficiencies; and
- The FCC and Congress should encourage public safety agencies, through incentives and other means, to implement commercial wireless technologies and to augment their existing communications networks with commercial wireless technologies, to the extent commercial solutions satisfy public safety requirements.

II. Allocating Additional Spectrum in the 700 MHz Band for Public Safety is Premature.

In its Notice, the FCC asked for comment on “whether or not Congress should provide an additional allocation of spectrum in the 700 MHz band for emergency response provider

communications.”¹⁰ Congress has allocated public safety users approximately 97 MHz of spectrum, including recent nationwide allocations of 24 MHz in the 700 MHz band, 4.5 MHz in the 800 MHz band, and 50 MHz in the 4.9 GHz band.¹¹ Public safety organizations have now requested up to an additional 30 MHz of spectrum consisting of the C and D blocks in the 700 MHz band, located at 747-762 MHz and 777-792 MHz. This spectrum is currently identified for auction to commercial users pending the DTV transition.¹²

According to some public safety organizations and advocates, Congress should allocate additional spectrum in the 700 MHz band for public safety use because its current spectrum allocations are insufficient, fragmented, and incompatible and not all allocated spectrum is currently available for public safety use.¹³ These organizations noted that 700 MHz spectrum, in particular, would be suitable for a nationwide interoperable public safety network.¹⁴ Although Ericsson supports the establishment of a nationwide interoperable public safety network, it does not believe that allocating additional 700 MHz spectrum for public safety use at this point will best achieve public safety interoperability.

¹⁰ See Public Notice at 2.

¹¹ See NIRA at § 7502(a), (c); *see also* Public Notice at 3.

¹² See “Spectrum for Public Safety Users,” Testimony of Mr. Gary Grube, Chief Technology Officer for Commercial, Government, and Industry Solutions, Motorola, before the United States Senate Committee on Commerce, Science, and Transportation (Sept. 8, 2004) (Grube Testimony); *see also* “Lucent: Dedicated Spectrum for Public-Safety Broadband Needed,” (Sep. 10, 2004) *available at* <http://mrtmag.com/news/radio_lucent_dedicated_spectrum/> (May 12, 2005).

¹³ See Grube Testimony.

¹⁴ See *id.*

A. *ERPs Can Use Their Existing Spectrum More Fully and Efficiently.*

1. *Some Public Safety Spectrum Remains Unused.*

While those advocating allocation of additional public safety spectrum suggest that additional spectrum is necessary to alleviate crowding and to allow future network expansion,¹⁵ their arguments are not conclusive. Specifically, public safety spectrum may be congested in some places. However, in other locations, up to 40% of the already allocated public safety spectrum lies fallow.¹⁶ Additionally, recent public safety spectrum allocations have still not been used.

For example, 24 MHz of spectrum in the 700 MHz band, allocated to public safety in 1997, remains unused by public safety entities because it is still populated by analog broadcasters. Congress is taking steps to speed the digital transition, which will clear these channels for public safety use. Ericsson encourages Congress and FCC to move expeditiously in this direction. However, even if Congress allocated more spectrum in the 700 MHz band for public safety use, it would not alleviate any crowding now. Any additional spectrum allocations

¹⁵ In 1996, the Public Safety Wireless Advisory Committee (PSWAC), established by Congress to analyze the current and future needs of the public safety community, reported that by 2010 public safety would require a total of approximately 145 MHz of spectrum. See “Radio Spectrum: A Vital Resource for Saving Lives and Protecting Property,” Public Safety Wireless Network Program, Department of Justice, available at <www.safecomprogram.gov/SAFECON/library/spectrum/1102_publicsafety.htm> (2000) at 5. Overall, according to the National Public Safety Telecommunications Council, spectrum currently allocated for public safety communication is insufficient and congested. See Comments of the National Public Safety Telecommunications Council, *In the Matter of Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies*, ET Docket No. 03-108 (May 3, 2004) at 4.

¹⁶ See Summary of Public Outreach Efforts Concerning State and Local Public Safety Spectrum Management Policies & Procedures, Office of Spectrum Management, National Telecommunications and Information Administration, U.S. Department of Commerce (May 2004) (NTIA Summary) at C-16.

in this band would also be unavailable until the digital transition is complete.¹⁷ Therefore, more spectrum would be identified for public safety without any additional spectrum being placed into service for public safety.

Also, in 1999, the Commission allocated 50 MHz of spectrum in the 4940-4990 MHz band (4.9 GHz band) for fixed and mobile wireless services in support of public safety.¹⁸ The flexible band plan established for this spectrum was intended to allow new broadband applications such as high-speed digital technologies and wireless local area networks for incident scene management.¹⁹ The FCC specifically noted that public safety agencies would benefit from using commercial off the shelf (COTS) technologies adapted from adjacent bands, and adjusted its technical rules for this spectrum to encourage this benefit.²⁰ The FCC recognized that leveraging COTS technologies could save state and local government funds, as well as potentially offer dual-band devices providing Internet access to public safety users via the adjacent 5.4 GHz Unlicensed National Information Infrastructure (U-NII) unlicensed band²¹ and the 5.850-5.925 GHz Intelligent Transportation System (ITS) band.²² This spectrum remains largely unused by public safety users.

Therefore, it is premature to consider allocating additional public safety spectrum until current spectrum allocations are fully and efficiently utilized and an appropriate nationwide

¹⁷ Congress has refused to clear the 700 MHz spectrum piecemeal, providing access to the allocated public safety spectrum first, stating that such an approach would treat various broadcasters disparately and would require “dislocation of up to 75 broadcast stations, which also serve a critical public safety function . . .” NIRA at § 7501(a)(6).

¹⁸ *See Memorandum Opinion and Order, In the Matter of the 4.9 GHz Band Transferred from Federal Government Use*, WT Docket No. 00-32 (Nov. 12, 2004) (*4.9 GHz Order*) at ¶ 2.

¹⁹ *See id.* at ¶ 4.

²⁰ *See id.* at ¶ 10.

²¹ *See id.*

²² ITS or Dedicated Short Range Communications (DSRC) systems operate in the 5.850-5.925 GHz band. *See id.* at ¶ 4.

spectrum plan is established.²³ Ericsson applauds the FCC for recognizing the benefits COTS technologies can provide to public safety users in the 4.9 GHz band and urges it to report to Congress that Public Safety can use COTS technologies in the 700 MHz band as well, rather than resort again to additional spectrum allocations.

2. *ERPs Can Employ Improved Technologies to Use Their Existing Spectrum More Efficiently.*

Allocating additional spectrum now is also premature because ERPs still have the opportunity to use their existing spectrum more efficiently through improved technologies. In fact, public safety agencies have noted that much of their communications equipment is “incompatible and aging.”²⁴ Use of such equipment prevents true public safety interoperability and limits spectrum efficiency. Congress recognized that many ERPs do not take advantage of advanced, commercially-available technology which, when combined with effective spectrum management, could drastically increase spectrum efficiency, likely eliminate much spectrum congestion, and decrease the overall amount of spectrum required.²⁵ Additional spectrum will not resolve this issue.

Moreover, technological innovations have created networks today that are 76 times more efficient than those used just ten years ago, when PSWAC recommended allocation of 145 MHz of public safety spectrum.²⁶ The continual development of technology will only continue to increase networks’ efficiency. Use of these advanced technologies will decrease the amount of

²³ See NTIA Summary at 25, 46, 52.

²⁴ See “The State of Public Safety Communications” at 7.

²⁵ See NIRA at § 7303.

²⁶ See Comments of Ericsson, *In the Matter of Facilitating Opportunities for Flexible, Efficient, and Reliable Spectrum Use Employing Cognitive Radio Technologies*, ET Docket No. 03-108 (May 3, 2004) at 10-11; see also “Final Report of the Public Safety Wireless Advisory Committee to the Federal Communications Commission and National Telecommunications and Information Administration,” available at <http://www.ntiacsd.ntia.doc.gov/pubsafe/publications/PSWAC_AL.PDF> (Sep. 11, 1996) (PSWAC Report) at 21.

spectrum needed for public safety communication, even as the functions of public safety entities expand.²⁷ As detailed in section II, below, advanced solutions will not only provide ERPs with additional capacity, but also increased functionality, additional services, and enhanced flexibility for future expansion.

Therefore, ERPs should be encouraged, through incentives and other means, to implement advanced solutions offered by commercial wireless technologies and to augment their existing communications networks with commercial wireless technologies. Commercial wireless technologies will help achieve interoperability, enhance spectrum efficiency, and take advantage of economies of scale.

B. An Additional 700 MHz Spectrum Allocation Will Not Necessarily Meet Public Safety's Needs.

1. Allocating Additional Spectrum for Broadband Communications at This Time is Unnecessary.

Public safety representatives have informed Congress that their current spectrum allocations will not allow them to deploy much-needed broadband wireless networks.²⁸ However, allocating additional 700 MHz spectrum is not the only way to provide public safety with a broadband network. Rather, broadband can be implemented within existing public safety spectrum, for example, by a simple rule change. The FCC could allow public safety users to aggregate at least four 50 kHz channels within this 24 MHz spectrum allocation so that they may use commercially available technology and incorporate new technology as it becomes available. In this way, public safety may use existing spectrum to help meet ERPs' broadband needs.

²⁷ See Comments of Ericsson at 11.

²⁸ See Testimony of Robert LeGrande, II, Deputy Chief Technology Officer, Government of the District of Columbia, Office of the Chief Technology Officer, Senate Committee on Commerce, Science & Transportation (Sep. 8, 2004).

Additionally, creating and maintaining an entirely new dedicated broadband network on top of the existing dedicated narrowband and potential wideband systems in 700 MHz spectrum would be cost prohibitive and contrary to the goal of achieving interoperability. Designating separate spectrum allocations for each of these multiple overlapping networks would consume a needlessly large amount of spectrum. Rather, the FCC should adopt an overarching spectrum management policy of flexibility for public safety, allowing ERPs to consolidate overlapping spectrum requirements and alleviate constrained resources.

2. *700 MHz Spectrum May Not Satisfy All Public Safety Agencies' Needs.*

Allocating additional 700 MHz spectrum for public safety use will not solve the inefficiencies derived from fragmented public safety spectrum. First, ERPs have already established networks using other technology that is not compatible with the 700 MHz band.²⁹ Also, many ERPs, already struggling with insufficient funding, cannot afford to replace the equipment and towers required to transfer to another band.³⁰ Others' needs are simply better satisfied by the characteristics of a different band.³¹ Before the FCC recommends an additional public safety spectrum allocation at 700 MHz, it should consider what solutions exist today, and what incentives can be established that will help address ERPs' requirements.

3. *Allocating the C and D Blocks of 700 MHz Spectrum for Public Safety Would Preclude Commercial Auction Within this Band, Decreasing Availability of Commercial Technology for Public Safety Use.*

Currently, the C and D blocks of the 700 MHz band are set for auction, pending the DTV transition. Once the Commission resolves DTV transition uncertainties, investment in the band

²⁹ See NTIA Summary at 31.

³⁰ See Guide to Radio Communications Interoperability Strategies and Products, Report No. TE-02-02, AGILE Interoperability Strategies for Public Safety, National Institute of Justice (Apr. 1, 2003) (AGILE Report) at 4-5.

³¹ See *id.* at 5.

will increase and commercial entities will begin developing and deploying 700 MHz services. Some services offered by commercial networks in these bands could help support public safety needs. Additionally, commercial equipment developed for these bands could be made available to public safety agencies and deployed in public safety spectrum. Specifically, if the FCC grants public safety entities more flexibility in aggregating channels in their allocated 700 MHz spectrum, as discussed more fully in section I (B)(1), above, ERPs will be able to deploy these commercially-developed standardized systems in these bands, to the extent these systems meet their needs.

Therefore, the FCC should continue its plan to auction the C and D blocks of the 700 MHz band for commercial use so that public safety users may receive the many benefits clearly available from commercial innovation in nearby bands. The Commission should also, as it did for the 4.9 GHz public safety band, provide technical flexibility for public safety entities in 700 MHz spectrum to encourage their use of COTS technologies.³²

C. Public Safety Use of Existing Spectrum Should Be Investigated in More Depth Before Congress Considers Allocating Additional Spectrum.

There are a number of inefficiencies in ERPs' use of existing public safety spectrum that prevent ERPs from realizing the spectrum's full potential.³³ Accordingly, over 90% of public safety entities agree that public safety spectrum requirements have not been adequately researched and addressed.³⁴ At this point, it would better serve the needs of public safety to investigate whether and in what ways ERPs can use existing spectrum more fully and efficiently. For example, insufficient competition for products and services in the band, particularly in such a

³² See *4.9 GHz Order* at ¶¶ 5, 10.

³³ See, e.g., NTIA Summary at C-16; NIRA at § 7303; "The State of Public Safety Communications" at 7, 9.

³⁴ See "The State of Public Safety Communications" at 7; see also NTIA Summary at 30.

highly concentrated provider market, may contribute to inefficient use.³⁵ The FCC should recommend in its Report that Congress ask the National Telecommunications and Information Administration (NTIA) or other appropriate agency to investigate the actual sources of inefficiencies in public safety's use of existing spectrum and recommend methods for addressing these inefficiencies first, before considering more spectrum allocation.³⁶ With more analysis of the inefficiencies' causes, Congress can be better informed about whether more 700 MHz spectrum is necessary.

III. Incorporating Commercial Wireless Technologies Into Public Safety Communications Networks Will Give ERPs the Tools to Achieve Interoperability.

The FCC also asked for comment on the extent to which commercial wireless technologies can satisfy the communications needs of ERPs.³⁷ The public safety community currently uses a mix of dedicated and commercial technologies to address tactical and administrative purposes. Presently, some jurisdictions primarily use commercial technology while other agencies rely on dedicated systems in dedicated spectrum. Interoperability, however, requires more than dedicated spectrum and equipment. Ericsson believes that public safety agencies, as a whole, will be better served by considering and using more commercial solutions either (1) within their existing dedicated spectrum; or (2) in commercial spectrum, to the extent that commercial services and applications can meet public safety needs. Commercial

³⁵ PSWAC Report at Appendix D.

³⁶ In the past, the NTIA conducted a study regarding public safety spectrum management policies and procedures. *See, e.g.*, NTIA Summary.

³⁷ *See* Public Notice at 2.

technologies can be an optimal means for addressing ERPs' interoperability and budget problems.³⁸

A. Commercial Technologies and Systems May be Used in Dedicated Public Safety Spectrum or to Provide Services to Public Safety in Commercial Spectrum.

Dedicated systems and technologies are not the only way to achieve public safety interoperability. Commercial systems and technologies, which could be readily available for public safety users upon auction of the C and D blocks of 700 MHz spectrum for commercial use, can conveniently provide the functionality required by ERPs.³⁹ Commercially available systems are modular, flexible, and built on open standards that allow integration of new technologies from multiple vendors and virtually limitless system expansion. Commercial technology is also highly interoperable, built to allow communication between multiple networks operating on multiple frequencies and using different technology. An ERP could deploy a commercial system in public safety spectrum which could provide interoperability with other public safety and commercial networks, widespread coverage, multiple levels of priority access to spectrum, and secure voice and data transmission, among many other features. Such a system could be either owned and managed by ERPs or by commercial entities. The competitive market of standardized commercial systems and technology, with its multiple suppliers, provides many additional benefits including equipment at the lowest possible cost and spectrum efficiency that could provide additional traffic capacity for use during emergency situations.⁴⁰

³⁸ John Muleta, Chief, Wireless Telecommunications Bureau, Federal Communications Commission, Presentation to National Academy of Science, Computer, and Telecommunications Board (Feb. 12, 2004).

³⁹ See section I (B)(3).

⁴⁰ See Wireless Priority Service (WPS): Overcoming Wireless Congestion in Emergencies, National Communications System, *available at* <http://wps.ncs.gov/documents/WPS_Overview_Brief_Mar05.ppt> (Apr. 13, 2005) (Wireless Priority Service) at 7.

In addition, an ERP could augment a dedicated public safety network with commercial technology. This approach could provide a balance between the dedicated network, with its specific and unique functions, and using spectrum-efficient commercial technology that supports new features and functions and promotes interoperability, such as handsets that allow seamless communication between multiple frequencies and modes of communication. Additionally, use of commercial equipment would provide flexibility and immediate capacity to expand when an emergency arises. For example, local ERPs responding to the Pentagon attack of 9/11 had agreements in place with commercial vendors who were able to, on short notice, provide additional handsets that allowed non-local ERPs without compatible equipment to communicate with local ERPs.⁴¹

Commercial networks could also host services and applications on commercial systems in commercial bands for public safety users, to the extent commercial solutions meet public safety requirements. ERPs could leverage commercial networks and technologies to complement their traditional public safety systems and provide redundancy, particularly in areas where ERPs have coverage problems.⁴² Through these means, ERPs may use commercial systems and technologies to communicate more broadly across jurisdictions and agency boundaries.

⁴¹ See “Learning to Talk” at 15.

⁴² See *id.* at 10.

B. ERPs Can Achieve Interoperability Through Commercial Systems and Technologies.

1. Commercial Handsets Can Provide Nationwide Interoperable Service Across Multiple Frequency Bands.

Commercial handsets are increasingly designed to operate across a variety of systems and in various bands incorporating a multitude of technologies.⁴³ These technologies include GPS, Bluetooth®, WiFi, CDMA, GSM, WCDMA, and CDMA2000®, among others. Multi-band handsets are available commercially.⁴⁴ Certain handsets function both as a wireless phone and a wireless broadband data terminal, allowing subscribers to receive an incoming wireless phone call while he or she is actively browsing the Internet. These handsets provide spectrum-efficient interoperability between diverse narrowband and broadband networks operating on fragmented spectrum.

Similarly, auction of 700 MHz band spectrum for commercial use will provide the basis for development of and investment in equipment for the band. Commercial equipment designed for the commercial portions of the 700 MHz band could be adapted to operate in the public safety band once the FCC relaxes its technical rules to permit operation of wider-banded technology. Implementing standardized commercial technology on an interoperable public safety network will allow the network to comprise multiple, non-consecutive frequency bands, linking a new broadband public safety network in the 700 MHz band to other existing networks across the nation.

2. Commercial Standards Support Interoperability.

Adoption or integration of commercial standards by the public safety community could improve interoperability by establishing an open model that allows integration of new, emerging

⁴³ See AGILE Report at 6-8.

⁴⁴ See *id.* at 7-8.

technologies from multiple vendors with virtually limitless system expansion flexibility. Commercial standards are being developed on an ongoing basis to ensure that new features and functions are incorporated in a way that maintains the stability of the network while ensuring customers' needs are met. Globally-developed standards, such as IMT-2000, are widely used in many countries as the basis for commercial communications. Commercial standards support interoperability between broadband and narrowband technology, as well as between users operating in different bands. They also provide optimum efficiency, flexibility, backwards compatibility, and are expandable, allowing growth in users, coverage area, and new services, with minimum initial investment.⁴⁵

3. *Commercial Systems Now Provide Widespread Coverage.*

Over the years, the public safety community has used commercial systems primarily for non-emergency communications, citing gaps in coverage in less-populated areas as a reason that commercial systems were inadequate for emergency public safety communications.⁴⁶ However, commercial systems have continued to expand their coverage over the last few years. Seamless next generation commercial wireless service is now available throughout the vast majority of the United States, and most areas are covered by multiple carriers.⁴⁷ Commercial wireless systems also provide consistent coverage in previously hard-to-reach areas, including inside most tunnels, underground, and inside large buildings.⁴⁸ Therefore, commercial systems can now provide

⁴⁵ See "About Mobile Technology and IMT-2000," International Telecommunications Union, available at <<http://www.itu.int/osg/spu/imt-2000/technology.html>> (Mar. 31, 2005).

⁴⁶ See "Commercial Wireless Technologies for Public Safety Users," Center for Criminal Justice Technology (July 2000) at 4.

⁴⁷ See *Ninth Report, In the Matter of Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Wireless Services*, WT Docket No. 04-111 (Sep. 28, 2004) at ¶ 21.

⁴⁸ See generally *Wireless Networks for In-Building Environments*, White Paper, Ericsson Inc, available at <http://www.ericsson.com/products/white_papers_pdf/3026_In_Building_A.pdf> (Apr. 2005).

public safety officials the widespread coverage often needed for emergencies. Also, commercial systems, which are flexible, adaptive, and modular, can quickly expand capacity and coverage at emergency locations through relay stations or additional, portable base stations.⁴⁹ Such systems, with proven nationwide abilities, could be deployed in public safety spectrum, or ERPs could use commercial networks for supplemental nationwide services, applications, and emergency backup capacity.

4. *Commercial Systems and Technologies Provide Reliable Access to Spectrum.*

Emergency response providers have remarked that commercial systems tend to “bottleneck” and become virtually useless during emergencies, when use suddenly and drastically increases.⁵⁰ However, recent technology developments have addressed capacity bottlenecks and now offer ERPs priority access to critical communications.

For example, since the events of 9/11, the FCC and DHS have developed a Wireless Priority Service (WPS) that allows ERPs operating under emergency situations priority access to spectrum used by existing commercial wireless networks.⁵¹ Currently, WPS is available throughout the nation from GSM carriers AT&T Wireless, Cingular, Nextel, and T-Mobile.⁵² Verizon Wireless and Sprint PCS are expected to offer CDMA WPS beginning in early 2006.⁵³ In the event of power outages or other events that would make cellular service unavailable, WPS

⁴⁹ See Ericsson Comments at 9.

⁵⁰ See SIECs: States’ Most Effective Tool for Coordinating Interoperability, Washington State Case Study and Best Practices Guide, available at <www.safecomprogram.gov/.../0/Washington_State_SIEC_Best_Practices_Guide.pdf> at 14-15.

⁵¹ See “Emerging Wireless Technologies: Priority Access Services in the Mobile Environment,” SAFECOM Program, available at <http://www.safecomprogram.gov/SAFECOM/library/technology/1168_priorityaccess.htm> (2002) (Priority Access Services) at 2.

⁵² See Wireless Priority Service at 7.

⁵³ See *id.*

satellite back-up is provided through carriers including Globalstar, Iridium, and Inmarsat.⁵⁴ ERPs could take advantage of WPS by using commercial networks' spectrum for emergency communications to prevent debilitating congestion of dedicated public safety networks⁵⁵ and could allow interoperability between local and multiple out-of-jurisdiction emergency responders even in the absence of an Incident Command System.⁵⁶ The same technology can also provide multiple tiers of priority access for emergency responders, providing great benefits to public safety users operating on a commercial system that includes this feature.⁵⁷

5. *Commercial Systems and Technologies Provide Secure Data and Voice Transmission.*

According to SAFECOM's Statement of Requirements, a public safety network must be able to assign specific authorization levels to individuals with particular roles and authenticate and authorize users/devices from any location on the network before allowing them to access to network resources.⁵⁸ The network must also be immune to attacks against communications traffic, provide safeguards to detect and prevent unauthorized access, reading, modification, or destruction of data, and conform to the current Federal Information Processing Standards, currently the Advanced Encryption System (AES).⁵⁹ Many commercial technologies support

⁵⁴ See *id.* at 14.

⁵⁵ See "Learning to Talk" at 4-5.

⁵⁶ See The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks Upon the United States, available at <<http://www.9-11commission.gov/report/index.htm>> (2004) at 397. The Incident Command System (ICS), developed in the 1970s, is the model tool for command, control, and coordination of emergency response and provides a means to coordinate individual agencies toward a common goal. Federal law requires use of ICS in response to HAZMAT incidents, some states mandate use of ICS for other emergency incident response, and many public safety organizations endorse ICS as a standard for emergency response. See "What is the Incident Command System (ICS)?" Dispatch Monthly, available at <http://www.911dispatch.com/ics/ics_describe.html> (Apr. 25, 2005).

⁵⁷ See Priority Access Services at 2.

⁵⁸ See SAFECOM Statement of Requirements at 62.

⁵⁹ See *id.* at 63.

AES and provide other advanced security features.⁶⁰ Specifically, commercial solutions can provide public safety users with significant security and, given their modular nature, can be modified to incorporate additional security features to meet public safety needs.

Commercially-available technologies provide radio access and end-to-end encryption and could provide public safety with special terminals or encrypted data channels to further enhance communications security. Additional security can be achieved through commercial technology by duplicating network components, utilizing national roaming to provide the best possible coverage, redundancy, and automatic switch-over, or using access clearance and control technologies to limit access to public safety networks.⁶¹ Commercial technologies provide security and protection against eavesdropping, interference, jamming, and detection.⁶² Through advanced technology, commercial systems and technologies provide much of the security that public safety communications require and can supply that technology for public safety use at a significantly lower cost because the technology is developed, tested, and deployed first for a broader and more competitive commercial market.

C. Commercial Systems, Technologies, and Standards Can Best Form the Basis of an Interoperable Public Safety Network for Broadband Services.

The public safety community is particularly interested in deploying a nationwide interoperable broadband network in 700 MHz spectrum, noting that broadband will allow ERPs, for example, to transmit image-rich records and streaming video at moderate speeds over wide

⁶⁰ See “Project 25, Public Safety Communications Interoperability – Frequently Asked Questions,” Telecommunications Industry Association, available at <http://www.tiaonline.org/standards/project_25/P25FAQ.pdf> (July 2004) (Project 25); see also Leveraging Commercial Wireless Technology for Interoperable Public Safety Communications, Lucent Technologies, available at <http://www.lucent.com/livelink/09009403800702e1_White_paper.pdf> (June 6, 2004) at 6.

⁶¹ See Project 25 at 9.

⁶² See “Public Safety Radio Frequency Spectrum: A Comparison of Multiple Access Techniques, Public Safety Wireless Network Program (Nov. 2001) at 8.

areas.⁶³ The commercial wireless industry has already developed technologies and systems that provide these very features on nearby spectrum. Commercial broadband technology will soon become available for this band if the FCC allows additional aggregation in this band and permits auctions of the 700 MHz C and D blocks for commercial use.

Commercial technologies can allow public safety users to benefit from the most advanced broadband technology available, interoperability between multiple frequency bands, open standards, mainstream standardized technology, and spectrum efficiency. Currently, many commercial carriers are beginning to implement IMT-2000 standards into their systems. Once completed, the new systems, capable of third generation (3G) mobile services, will provide high-speed data transmission and real-time video telephony. Public safety officials using such systems will be able to communicate via video between incident scenes and central locations such as control centers and hospitals. 3G systems based on IMT-2000 standards will likewise offer numerous end-user applications. These systems are built using layered structures with open interfaces, ensuring that many vendors can develop applications not only for the general public, but also for specialized or niche users such as public safety agencies.

Use of standardized, commercially-available broadband systems and technology would provide public safety users with fully-developed, tested, and proven communications equipment that is particularly equipped to provide advanced, expansive, spectrum-efficient broadband services that are economical to maintain and expand. Additionally, commercial broadband technologies provide the majority of voice and data services needed for public safety communications while also meeting many of its performance requirements, including high quality voice stream, minimal mouth-to-ear delay, short set-up time, authentication, high-quality

⁶³ See Grube Testimony.

video, interference resilience, outage and failure reporting and repair, among others.⁶⁴ Additional functionalities can be added onto commercial technologies as needed by ERPs.

D. Commercial Systems and Technologies Provide Affordability and Economies of Scale, Particularly on a Nationwide Interoperable Network.

Lack of adequate funding to upgrade and maintain existing infrastructure and replace outdated systems is one of the public safety community's primary concerns.⁶⁵ Many agencies do not have the resources to build new towers and purchase new equipment or maintain a new network. Additionally, keeping pace with advancing technology is becoming increasingly expensive as technology becomes more complex, involving numerous gateway and enabling technologies, new architectures, platforms, and multi-media. Establishing dedicated networks encompassing these advances would require significant financial investment as well as time, effort, and skilled operators. Public safety organizations are not adequately funded to handle the complexities of these new capabilities.

COTS technologies can help the public safety community benefit from advancing technology at a substantially lower cost. International standardization has provided a number of advantages for commercial technologies including economies of scale, multiple suppliers, a competitive market, and a wide variety of available handsets. Other market segments have seen the advantage of standardized commercial products. For instance, some military and public safety networks are now being designed with COTS products built on open commercial standards.⁶⁶ Such open standards are particularly important for high-performance applications where costs are normally prohibitive. In a market with limited volume, such as the current

⁶⁴ See SAFECOM Statement of Requirements at 79-84.

⁶⁵ See "The State of Public Safety Communications" at 7.

⁶⁶ See, e.g., "Ericsson WCDMA Selected for US Navy Satellite Project," Converge! Network Digest, available at <<http://www.convergedigest.com/Wireless/broadbandwirelessarticle.asp?ID=14099>> (Mar. 15, 2005).

public safety market, the cost of advanced equipment is generally prohibitively expensive. Use of technology developed in the commercial market, where cost is kept low by competition, would allow even underfunded ERPs to benefit from the many new capabilities provided by advanced and emerging technologies. Additionally, as more and more public safety agencies pursue these innovative, efficient technologies, economies of scale and competition for public safety customers will continue to drive costs down even further.

E. Commercial Technologies Are Also Being Adopted by Other Public Safety Users Across the World.

Around the world, public safety organizations are implementing commercial technology as part of their interoperable communications systems which provides the public safety community with substantial benefits.⁶⁷ With incentives and “tweaking,” COTS technologies can meet additional public safety requirements.⁶⁸ Dedicated public safety solutions, on the other hand, while meeting many public safety requirements, are not interoperable, create a demand for more dedicated public safety spectrum, do not provide high-speed data access, have limited capacity, and tend to be quite expensive.⁶⁹

Responding to an elusive single answer to public safety’s communications needs, many countries have implemented solutions consisting of combinations of dedicated and commercial technology, and some entirely commercial technology. The United Kingdom has recommended that commercial technology be integrated with dedicated systems to provide efficient and cost-

⁶⁷ See, e.g., “TETRA MOU: The Use of Public Mobile Communications for the Emergency Services,” Mason Communications, LTD, *available at* <<http://www.bapco.org.uk/?page=TETRAMoU.doc>> (Mar. 2003) at 33-34.

⁶⁸ See “Northern Exposure,” Government Technology, *available at* <<http://www.govtech.net/magazine/story.print.php?id=20945>> (Aug. 8, 2002).

⁶⁹ See “Public Safety Rethinks the Future,” Mobile Radio Technology Magazine, *available at* <http://mrtmag.com/pubsafety/fire/radio_public_safety_rethinks/> (Mar. 1, 2004).

effective voice and data services.⁷⁰ As of late 2004, Sweden was considering transitioning its TETRA public safety network to CDMA 450, a commercial technology that operates in the 450 MHz band using IMT-2000 technology.⁷¹ Norway has been considering a similar transition.⁷² Canada has established a number of public safety networks using commercially-owned and operated systems and technologies in public safety spectrum.⁷³

Commercial technologies have been proven throughout the world to meet many of public safety's requirements while also providing advanced capabilities and emerging technologies at a low cost. These technologies can be and have been used to complement dedicated public safety equipment and networks and even replace some dedicated equipment entirely.⁷⁴

IV. Conclusion.

Ericsson applauds the efforts of Congress and the FCC to investigate how best to satisfy the communications needs of the public safety community and agrees that a nationwide interoperable public safety network would provide great benefits to the public. However, Ericsson believes that allocating additional 700 MHz spectrum for public safety use at this time would not address these concerns. Ericsson recommends that the FCC:

- Recognize that allocating additional spectrum in the 700 MHz band for public safety is now premature and could divert focus from the core issues that currently prevent public safety interoperability;

⁷⁰ See, e.g., "The Use of Public Mobile Communications for the Emergency Services." at 33-34.

⁷¹ See "Public Safety Rethinks the Future."

⁷² See *id.*

⁷³ See "Public Safety & Disaster Relief: A Wireless Network Operators Perspective," Bell Mobility, available at <http://www.rcmp-grc.ca/news/2003/n_0319_e.htm> (Mar. 26, 2002) at 3.

⁷⁴ See "Northern Exposure;" see also "Public Safety & Disaster Relief."

- Recognize the benefits COTS equipment can provide to the public safety community, as it did in its *4.9 GHz Order*, and that auction of the C and D blocks of 700 MHz for commercial use can improve the availability of commercial technologies to public safety users by creating opportunities similar to those recognized in the *4.9 GHz Order*;⁷⁵
- Recommend that Congress request a study investigating the sources of inefficiencies in public safety spectrum use and recommending methods of addressing those inefficiencies;
- Encourage the public safety community to use its existing spectrum more fully and efficiently by establishing flexible public safety spectrum management policies, specifically allowing aggregation of spectrum in 700 MHz beyond 150 kHz; and
- Encourage public safety agencies, through incentives and other means, to integrate improved, efficient technology into its networks by using standardized commercial wireless technologies to the extent commercial solutions satisfy public safety requirements.

By encouraging integration of commercial technology into public safety networks, the FCC will help ERPs to achieve fully interoperable public safety communications in an efficient and cost effective manner.

Respectfully submitted this 28th day of April, 2005.

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⁷⁵ *See id.*